

### **REMARKS / ARGUMENTS**

The present Amendment is in response to the Office Action mailed February 24, 2005. Claims 1, 4, 7, 8-9, 14-19, and 24 are amended. Claims 1-24 are now pending in view of the above amendments.

Please note that the following remarks are not intended to be an exhaustive enumeration of the distinctions between any cited references and the claimed invention. Rather, the distinctions identified and discussed below are presented solely by way of example to illustrate some of the differences between the claimed invention and the cited references. In addition, Applicants request that the Examiner carefully review any references discussed below to ensure that Applicants understanding and discussion of the references, if any, is consistent with the Examiner's understanding. Reconsideration of the application is respectfully requested in view of the above amendments to the claims and the following remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in the order in which the corresponding issues were raised in the Office Action.

#### **Amendments to the Drawings**

The Examiner objected to Figures 1 through 6C. Applicants submit replacement sheets including Figures 1 through 6C. Withdrawal of the objection to the drawings is respectfully requested.

#### **Rejections Under 35 U.S.C. §102**

The Office Action rejected claims 1-3, 5-6, 8, 14, 19-20 and 22 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,719,891 (*Jewell*). Anticipation requires that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The following discussion illustrates *Jewell* does not satisfy the requirements of *Verdegaal* with respect to claims 1-3, 5-6, 8, 14, 19-20, and 22.

The Office Action suggests that *Jewell* shows and discloses a VCSEL comprising a first mirror (Fig 5C: 82) and an active area (Fig. 5C: 86), a dielectric gain guide on the active area

having a cavity or opening (Fig 5C: 26, 28, 32), and a second mirror on said dielectric gain guide (Fig 5C: 82, 84, 86, 26, 28, 32, 112 and col. 7, lines 15-50). Applicants respectfully disagree.

The Office Action indicates that the layers or portions identified by the reference numerals 26, 28 and 32 of *Jewell* teach a dielectric gain guide. Instead of a dielectric material, *Jewell* in fact teaches "nonoxidizing layers 26, [and an] oxidation barrier 32 surrounded by oxidized portions 28". See col. 7, lines 32-34. Further, *Jewell* differentiates between a dielectric layers and the nonoxidizing layers 26 and the oxidized portions 28.

*Jewell* states:

Light emitters may have a bottom mirror and a top mirror. . . . Bottom mirrors are preferably either conventional semiconductor mirrors comprising alternating semiconductor layers, or oxidized comprising alternating layers of semiconductor material and oxidized semiconductor material. . . . Top mirrors may also have either of these two configurations, and additionally may comprise dielectric and/or metallic materials since epitaxial growth above them is not generally necessary. See *Jewell* col. 6, lines 51-64 (*emphasis added*).

This distinction made by *Jewell* between oxidized semiconductor material, nonoxidized semiconductor material, and dielectric material is further illustrated in Figure 5B, for example, which includes nonoxidizing layers 26, oxidized portions 28 and dielectric layers 107 and 108. See *Jewell* col. 7, lines 22-29. The dielectric layers 107 and 108 are situated above and distinct from the oxidized portions 28. See Fig. 5B. Similarly, Figure 5E of *Jewell* illustrates dielectric layers 135 and 136 as being situated above and distinct from the nonoxidized layers 26 and the oxidized portions 28. See Fig. 5E. This is consistent with the teachings of *Jewell* stated above, in that the top mirrors may additionally comprise dielectric materials since epitaxial growth above them is not generally necessary. See *Jewell* col. 6, lines 51-64. For at least these reasons, the nonoxidizing layers 26, oxidation barrier 32 and oxidized portions 28 do not teach or suggest a dielectric gain guide having an aperture formed therein.

Further, the dielectric layers that are taught by *Jewell* and are illustrated, for example, in Figures 5B and 5E are formed as mirrors and therefore do not have an aperture formed therein. See col. 7, lines 15-61. In fact, forming an aperture in the dielectric layers of Figures 5B and 5E would prevent the dielectric layers from being a mirror.

As stated above, anticipation requires that of a claim is only anticipated if and only each element as set forth in the claim is found in the reference. In *Jewell*, the dielectric layers (such as the dielectric layers 107 and 108) are located above both the bottom mirror and the top mirror. See e.g., Figure 5B, Figure 5E.

Claim 1, in contrast, requires a dielectric gain guide situated on said active region, which is situated on a first mirror. Claim 1 also require that the dielectric gain guide includes an aperture. Then, claim 1 requires that a second mirror is situated on the dielectric gain guide. In other words, the dielectric gain guide, which has an aperture formed therein, is situated between the active area and the second mirror.

*Jewell*, as discussed above, places the dielectric layers above both the top and bottom mirrors. As a result, the elements of claim 1 as set forth in claim 1 are not taught or suggested by *Jewell*. Further, the dielectric layers taught by *Jewell* do not have an aperture formed therein. Because the dielectric layers taught by *Jewell* act as a mirror, forming an aperture in these dielectric layers would obviate their purpose as mirrors.

Claim 1 also requires that the electric gain guide is deposited on the active area according to a pattern in order to form an aperture in the dielectric gain guide. In contrast, *Jewell* does not teach depositing the dielectric gain guide according to a pattern. Rather, *Jewell* teaches controlled lateral oxidation of a portion of the top mirror. See col. 2, lines 55-57. Lateral oxidation does not teach or suggest depositing a dielectric gain guide on the active area according to a pattern.

For at least these reasons, claim 1 is not taught or suggested by *Jewell* and is in condition for allowance. For similar reasons, independent claims 8, 14, and 19 are likewise not taught or suggested by *Jewell* and are in condition for allowance. *Jewell* does not teach or suggest, for example, masking the dielectric gain guide with a mask in order to pattern the dielectric gain guide for an aperture as required by claim 8, patterning the confinement means with a mask as required by claim 14, and forming the dielectric layer using a dielectric deposition process while the other layers are formed using an epitaxial process. The dependent claims 2-3, 5-6, 20 and 22 also overcome the cited art for at least the same reasons.

**Rejections Under 35 U.S.C. § 103**

The Office Action rejected claims 4, 6-7, 9-13, 15-18, 21 and 23-24 under 35 U.S.C. § 103(a) as being unpatentable over *Jewell*. For at least the reasons discussed above, claims 4, 6-7, 9-13, 15-18, 21 and 23-24 are not taught or suggested by *Jewell* and are therefore in condition for allowance.

**Conclusion**

In view of the foregoing, Applicants believe the claims as amended are in allowable form. In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, or which may be overcome by an Examiner's Amendment, the Examiner is requested to contact the undersigned attorney.

Dated this 24<sup>th</sup> day of August 2005.

Respectfully submitted,



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**AMENDMENTS TO THE DRAWINGS:**

Attached are six (6) sheets of replacement drawings. These sheets, which include Figures 1 through 6C, replace the original sheets including Figures 1 through 6C.

Attachment: Six (6) Replacement Sheets